Abstraction as an Approach to the Learning of Basic Design

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Abstract

The basic design lesson is an introductory course that teaches students the fundamental principles of design, including elements such as form, space, scale, proportion, and composition. It is also an introduction to both concrete thinking and abstract one, which is rather about ideas and general thought. Abstraction is one of the steps applied for design learning processes because it may improve students' capacity for creative thinking. In practice, architects may use abstraction to simplify complex design problems and create clear, concise solutions.

Basic Design Studio at Faculty of Architecture, Fatih Sultan Mehmet Vakif University (FSMVU), has dealt with the task of abstraction, while each generation's initial phase changed. This paper aims to define basic steps that guided students in FSMVU to apply abstraction in developing their final design, starting from objects from nature to geometrically defined shapes.

Keywords: *Abstraction, basic design, design studio, education, architecture*

1. Introduction

The design process leads to a creative solution broadly applied in different disciplines. Thus, it varies from process design to solution design. However, teaching the design process is essential in producing physical and spatial elements, particularly architecture. The attitudes toward the learning process also vary in different schools and among various scholars. Although the methods vary, basic design covers fundamental design principles, such as line, form, space, proportion, scale, color, texture, and composition. Most basic design lessons' syllabus comprises tasks that teach students to analyze and evaluate designs based on fundamental principles. Thus, introductory design courses often involve hands-on projects that require students to develop technical skills such as drafting, model making, abstracting, sketching, and presenting. In this way, different tasks may develop skills essential for evaluating design problems and developing practical solutions. These various tasks encourage students to think creatively and experiment with design concepts to create unique design styles and approaches.

Abstraction is a process widely applied and used in architectural practice that provides profound comprehension of details. This abstraction process helps to complex realms purifications to fewer details and arrangements into geometrically defined forms. Further on, developing abstraction thinking will allow them to deal with ideas to comprehend relationships among elements as a part of mental process in contrary to concrete thinking which is focused on defined facts objects within certain context.

In the practice the concept for the architectural design results from inputs taken from inspiration from understanding the particular environment and its features such as socio-cultural features, surrounding, users, geopolitical circumstances, level of cultural development, cultural status, understanding of beauty, etc. Nevertheless, different inputs would lead to the different final production while passing the process of understanding, extracting, purifying and defining final design.

This article explores the significance of Basic Design education in the context of design methodology, specifically the application of abstraction. A detailed examination of student work will demonstrate how abstraction can be used as an effective design tool to create regular and organized forms. In the end it will be possible to define success of students in dealing with complex environment while abstracting new regular and organised forms.

In doing so, this article will refer to the approach applied in FSMVU at Basic Design lessons with first year students at undergraduate program. In this research, the composition of the forms taken from the nature constitutes the first stage of the study. Further on abstraction task was developed throughout four hands-on tasks.

2. Basic Design Education and Its Implications in Türkiye

Design-based programs such as architecture and interior design encounter an introductory design course in the first year of study programs, which triggers and fosters skills such as conceptualizing, designing, organizing, and expressing. These programs incudes a drawing-based alphabet because they focus on creating spaces and built environments. Also, it introduces students to the systematic approach to design and basically their architectural designing skills are initiated with the introductory design course.

At first, students are taught about the basics of design by understanding basic elements such as line, point and pattern. Also, students are expected to explain their thoughts by drawing sketches in the practical exercises while being taught the importance and necessity of sketching. Later on, color theory and the ability to use colors are taught through techniques such as watercolor and charcoal. The basic design education process introduces also fundamental design principles such as harmony, balance, contrast, symmetry, repetition, and proportion, which are used in both, two and three-dimensional representations. Further on, it also integrates designing by conceptualizing and building masses and volumes using these principles while encountering concepts such as abstraction, combination, reduction, etc.

The Basic Design course in Turkish architecture and design faculties varies in scope and content, depending on the number of hours and semesters allocated by each faculty. For instance, some universities offer a 6-hour Basic Design course for two semesters, with the system covering Basic Design principles and elements and the applications of fundamental issues. Students work on small projects such as point-line-plane-volume, visual perception-gestalt, scale-ratio-hierarchy, light and color, static-dynamic effects, abstraction, and creating two and 3-dimensional compositions. The last task may involve constructing one-to-one scale models produced as a team work.

In some programs, Basic Design is a one-semester course. The course duration affects the content, with shorter periods focusing on Basic Design principles in 2D and 3D compositions.

However, a common problem encountered in almost every university's Basic Design course is that students do not have a background in drawing and design from high school education. Therefore, there is a need to develop skills such as sketching, drawing techniques, and visual communication techniques within the scope of the course; if the department's semester program does not include classes that teach these techniques, a part of the Basic Design course may need to be dedicated to this topic as well.

3. Case study: Abstraction steps in FSMVU Basic Design Studio

Abstraction is a mental process that helps isolate the common features in a group or the features of the whole parts as defined in the dictionary (Cambridge, n.d). It is a form of design thinking that helps to form specific qualities of a group or the parts. Thus, it is used in design studies. Abstraction can be defined as not a linear process but a cyclic process that helps to think about relations between parts and the whole to catch their relational essence. Thus, many researchers have utilized abstraction and types of abstraction in design studies. Gibson, Rapoport, Gestalt, and Appleyard define different types of abstractions in their studies (Gibson, 1950, 1968; Rapoport, 1977; Appleyard, 1973, 1980). Besides, Gencosmanoglu and Nezor classify the abstraction types as formal, functional, and semantic (Gencosmanoglu and Nezor, 2010). According to the classification, formal abstraction is a type of abstraction that represents concrete forms with their simplified and basic features. A functional abstraction is an abstraction form meaning more technical details on different subject matters. In semantic abstraction, subjective values, life experiences, culture, and knowledge of the individuals form the abstraction (Gencosmanoglu and Nezor, 2010).

Abstraction as a method in design processes has different approaches. According to Uraz (1993), purifying from details, decreasing/reducing, differentiating/emphasizing, and making comparisons are the processes of abstraction. According to Besgen, differentiating, isolating, correlativity, generality, simplicity, geometrization, and reaching the essence are the stages of abstraction (Besgen, 1996). The common idea of abstraction is to get the essence when looking at broad definitions.

In the Faculty of Architecture and Design at FSMVU, the Basic Design course is arranged as one semester 8-hour course. The course covers critical topics such as Basic design principles and elements, color theories, gestalt and abstraction.

As final projects students had task to design insect hotel, and the task of abstraction which is developed under the supervision of instructors and individual work. Students are developing their work upon receiving comments. It is an effective teaching method in this course, and it is done once or twice at every lesson.

The design of the insect hotel should be an assemblage of natural materials in the first phase of abstraction. In this study, formal abstraction is used for the geometric composition. The students were expected to simplify the relationship between reality and abstraction to the extent of keeping the essence of the composition.

3.1. Methods of the Study

The students were given a design problem to create an insect hotel using materials collected from nature and to assemble a composition measuring 21x21cm while adhering to basic design principles. The following steps were applied in the process of the study;

- Select natural materials and assemble them into one composition following Basic Design principles.
- Create a geometric composition in a 21x21 cm frame with organic materials such as leaves, branches, and cones.

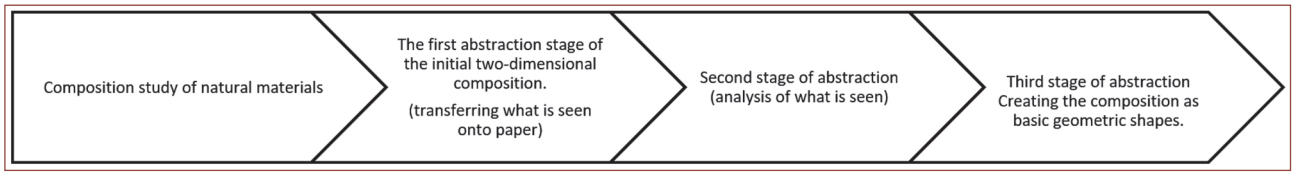

Figure 1. Stages of the Study

Figure 2. First stage of abstraction, the composition of natural materials in a frame by following basic design principles

– Draw the organic composition to the paper in freestyle in a 21x21cm frame and analyze the outcome.
– Purify forms from details.
– Isolating and simplifying forms.
– Finding the essence of the composition.

In the project's first stage, the students were asked to collect natural materials and create a composition for how these materials would be used. The students then created a cardboard base for the composition and arranged the collected materials within this frame. They were then asked

Figure 3. Second stage of abstraction, the composition of natural materials and analysis of the natural geometries in a frame following Basic Design Principles

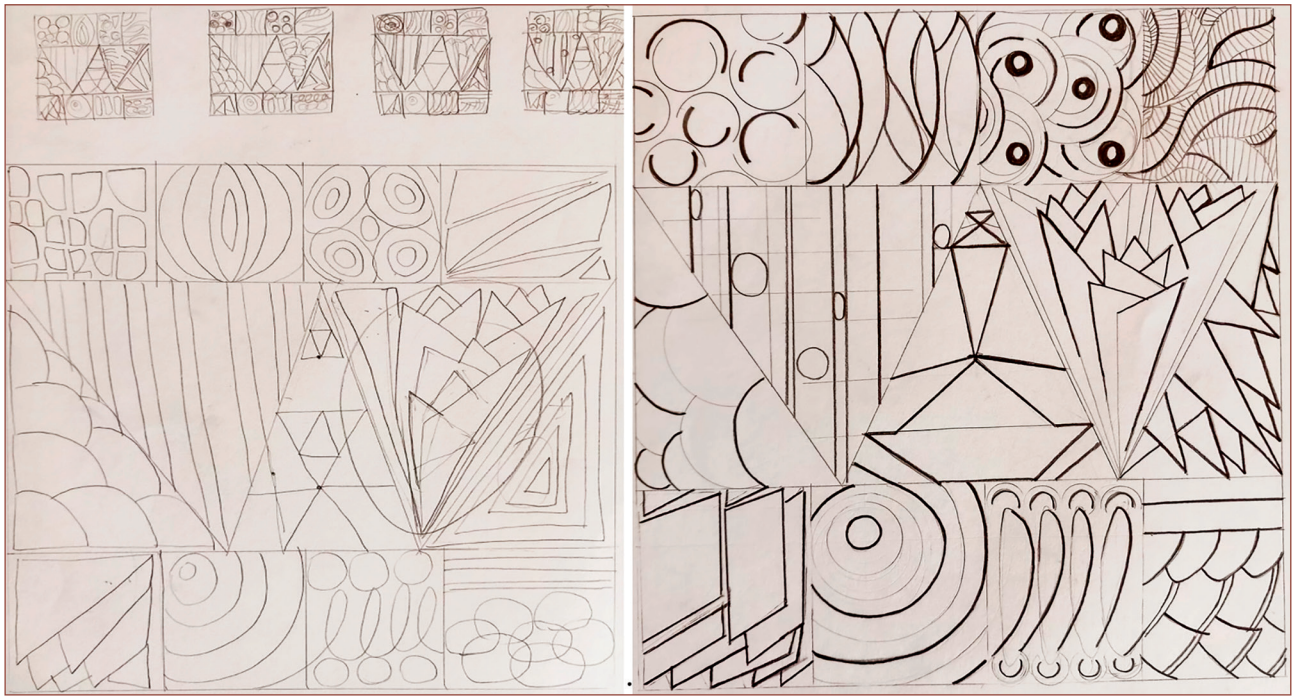

Figure 4. In the third stage of abstraction, the focus is on purifying forms from unnecessary details, simplifying, and geometrizing

to draw a two-dimensional composition of the resulting three-dimensional work. This first stage represents the initial abstraction phase of the project. The first stage visualised the completed insect hotel design, and the accompanying sketch shows the initial composition work (Figure 2).

In Figure 3, an analysis was made of the first drawing. In this stage, basic geometries were attempted to be discovered. After analysing the composition of the second stage, unnecessary details are eliminated, and forms are turned into elements in geometric compositions. The fourth stage of abstraction is characterized by simplifying and geometrizing the forms by purifying them from details. In this stage, the composition is reduced to its fundamental geometric shapes, such as circles, squares, and triangles (Figure 4). The aim is to discover the underlying geometric structure of the composition and to create a more simplified and unified form. By reducing the complexity of the composition, the focus is shifted towards the essential aspects of the design, which helps to strengthen the overall visual impact. This stage is important for the design process as it is also a foundation for the final composition.

6. Conclusion

The design as a process applied for developing new architectural forms start from idea toward space production which is result of the concept arouse from the objects and realm surrounding certain environments. To be able to deal with the architectural design in the future students at FSMVU are learning abstraction process as part of the curriculum of Basic Design lessons at first year of the undergraduate program.

This study showed processed of abstracting forms from organic and complex details to simplified geometrically defined one. It was conducted in three abstracting stages. As a result

Basic Design education provided students necessary skills needed to cope with complex design challenges and successfully accomplish. It can be applied to many other design problems to simplify complex issues and their structure.

Abstraction may help students to develop;

- Conceptual modeling skills; creating simplified representations of complex design problems to help understand the underlying structure and relationships.
- Parametric design approach; create complex and variable design solutions that can be adjusted based on specific parameters, such as parametric design.
- Finding repeatable solutions to design problems to develop design patterns that can be a possible starting point for other designs.
- Ability to structural thinking; developing the ability to behave in a complex environment and minimize it to certain fundamental elements. From more fluid, complex, and irregular to more organized and geometrically defined results.
- Ability to relational thinking; developing abstraction thinking will allow them to deal with ideas to comprehend relationships among elements as a part of the mental process, contrary to concrete thinking, which focuses on defined facts and objects within a specific context.

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